



FCC PART 74 TEST REPORT

For

Enping Misha Electronic Co., Ltd

Pingshi Development Area Enping City, Guangdong Province China

FCC ID: SW6MA-338

Report Type: Original Report	Product Type: Wireless microphone
Test Engineer: <u>Dean Liu</u> 	
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Reviewed By: Sula Huang RF Leader	
Test Laboratory: Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn	

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Enping Misha Electronic Co., Ltd* 's product, model: *MA-338 (FCC ID: SW6MA-338)* (the "EUT") in this report is a transmitter unit of *Wireless microphone* , which was measured approximately:24.5 cm (L)×5.1cm (W)×5.1 cm (H), rated input voltage: DC 9V from battery

**All measurement and test data in this report was gathered from production sample serial number: 150911013 (Assigned by BACL, Dongguan). The EUT supplied by the applicant was received on 2015-09-15.*

Objective

This test report is prepared on behalf of *Enping Misha Electronic Co., Ltd.* in accordance with Part 2, Part 74 of the Federal Communications Commission rules.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of federal Regulations Title 47 Part 2, Sub-part J as well as the following individual parts:

Part 74 – Experimental Radio, Auxiliary, Special Broadcast And Other Program Distributional Services

Applicable Standards: TIA-603-D.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 06, 2015.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a test mode.

EUT Specification:

Operating Frequency Band	180-207.6 MHz
Modulation Mode	FM
Rated Output Power	2mW

Equipment Modifications

No modifications were made to the unit tested.

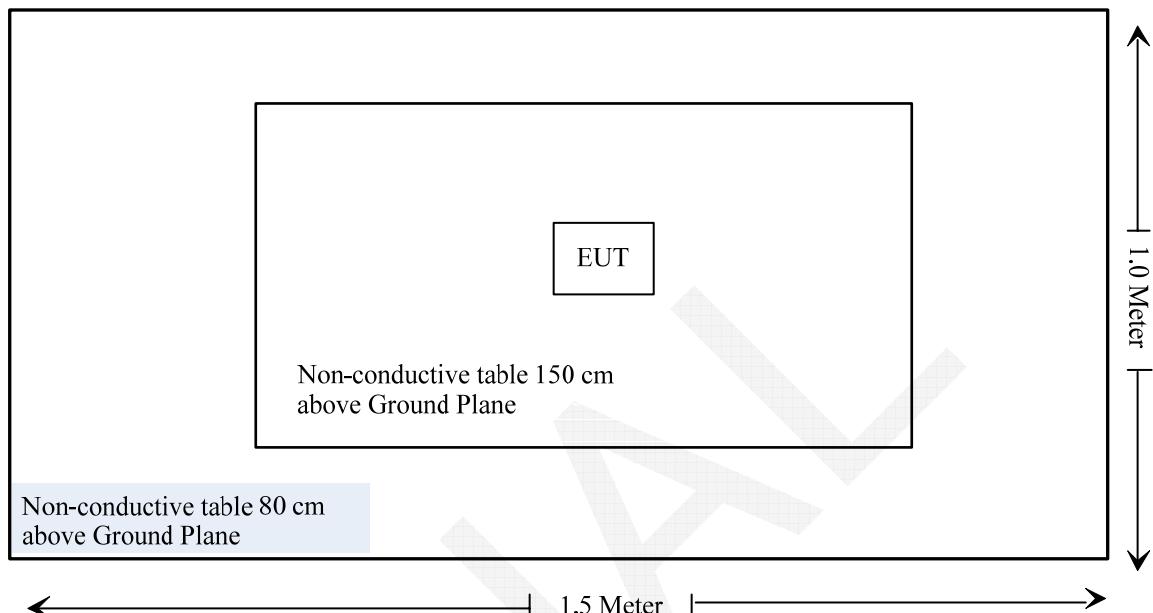
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

External Cable

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
/	/	/	/	/	/

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§1.1310; §2.1093	RF Exposure	Compliance
§2.1046 §74.861(e)(1)(i)	RF Output Power	Compliance
FCC §74.861(e) (2)	Crystal Controlled or Frequency Synthesized	Compliance
§2.1047 §74.861 (e)(3)	Modulation Characteristic	Compliance
§2.1049 §74.861 (e)(5)(6)	Occupied Bandwidth & Emission Mask	Compliance
§2.1051;§74.861(6)	Spurious Emission at Antenna Terminal	Not Applicable
§2.1053 §74.861 (e) (6)	Spurious Radiated Emissions	Compliance
§2.1055 §74.861 (e) (4)	Frequency Stability	Compliance

FCC §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

According to §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB447498 D01 General RF Exposure Guidance v05r02:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

Measurement Result

The maximum output power = 2.4 dBm (1.74 mW) at 199.6 MHz

$$[(\text{max. power of channel, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \\ = 1.74 / 5 * (\sqrt{0.1996}) = 0.155 < 3.0$$

So the stand-alone SAR evaluation is not necessary.

FCC §2.1046 &§ 74.861- RF OUTPUT POWER

Applicable Standard

FCC §2.1046, § 74.861.

(e) For low power auxiliary stations operating in the bands allocated for TV broadcasting, the following technical requirements apply:

(1) The power of the measured unmodulated carrier power at the output of the transmitter power amplifier (antenna input power) may not exceed the following:
(i) 54-72, 76-88, and 174-216 MHz bands—50 mW

Test Procedure

Radiated RF Output Power:

TIA-603-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
HP	Signal Generator	8648A	3426A00831	2014-11-06	2015-11-06
Sunol Sciences	Antenna	JB3	A060611-1	2013-09-05	2016-09-05
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
R&S	EMI Test Receiver	ESCI	100224	2015-05-09	2016-05-09
N/A	Coaxial Cable	14m	N/A	2015-05-06	2016-05-06
N/A	Coaxial Cable	8m	N/A	2015-05-06	2016-05-06

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	27.1 °C
Relative Humidity:	58 %
ATM Pressure:	100.3kPa

The testing was performed by Dean Liu on 2015-09-21.

Test Result: Compliance. Please refer to following tables.

Test mode: Transmitting

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Frequency:180.100 MHz								
180.100	H	64.11	-23.5	0.0	0.4	-23.9	17.0	40.9
180.100	V	87.58	2.4	0.0	0.4	2.0	17.0	15.0
Frequency:199.600 MHz								
199.600	H	63.73	-22.1	0.0	0.5	-22.6	17.0	39.6
199.600	V	85.40	2.9	0.0	0.5	2.4	17.0	14.6
Frequency:207.500 MHz								
207.500	H	62.19	-23.6	0.0	0.5	-24.1	17.0	41.1
207.500	V	84.92	2.3	0.0	0.5	1.8	17.0	15.2

FCC §74.861 (e)(2)- Crystal Controlled or Frequency sysnthesized

Applicable Standard

FCC §74.861(e) (2)

(e)(2) Transmitters may be either crystal controlled or frequency synthesized.

Note: The transmitter uses crystal controlled.

FINAL

FCC §2.1047 & §74.861 - MODULATION CHARACTERISTIC

Applicable Standard

FCC§2.1047 & §74.861:

(e) (3) Any form of modulation may be used. A maximum deviation of ± 75 kHz is permitted when frequency modulation is employed.

Test Procedure

Test Method: TIA/EIA-603 2.2.3

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
HP	RF Communications Test Set	8920A	00 235	2015-05-09	2016-05-09
N/A	RF Coaxial Cable	20cm	N/A	2015-05-06	2016-05-06
N/A	RF Coaxial Cable	10cm	N/A	2015-05-06	2016-05-06

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	27.1 °C
Relative Humidity:	58 %
ATM Pressure:	100.3 kPa

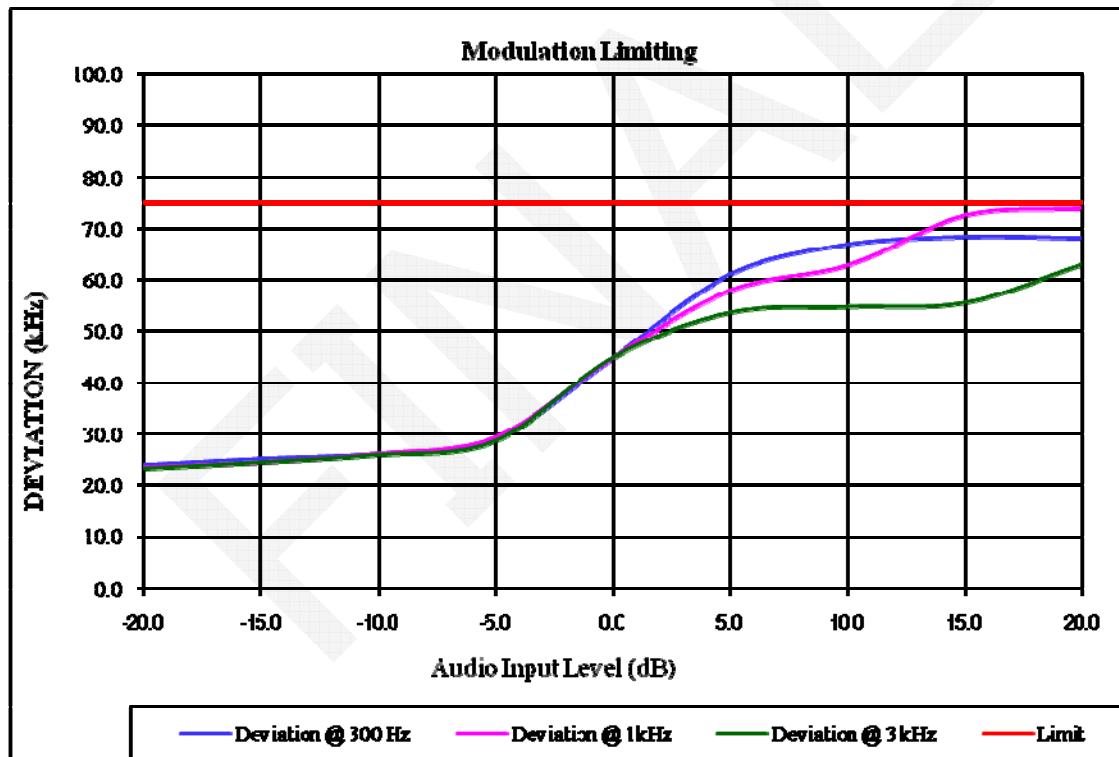
The testing was performed by Dean Liu on 2015-09-21.

Test Result: Compliance. Please refer to following tables and plots.

MODULATION LIMITING

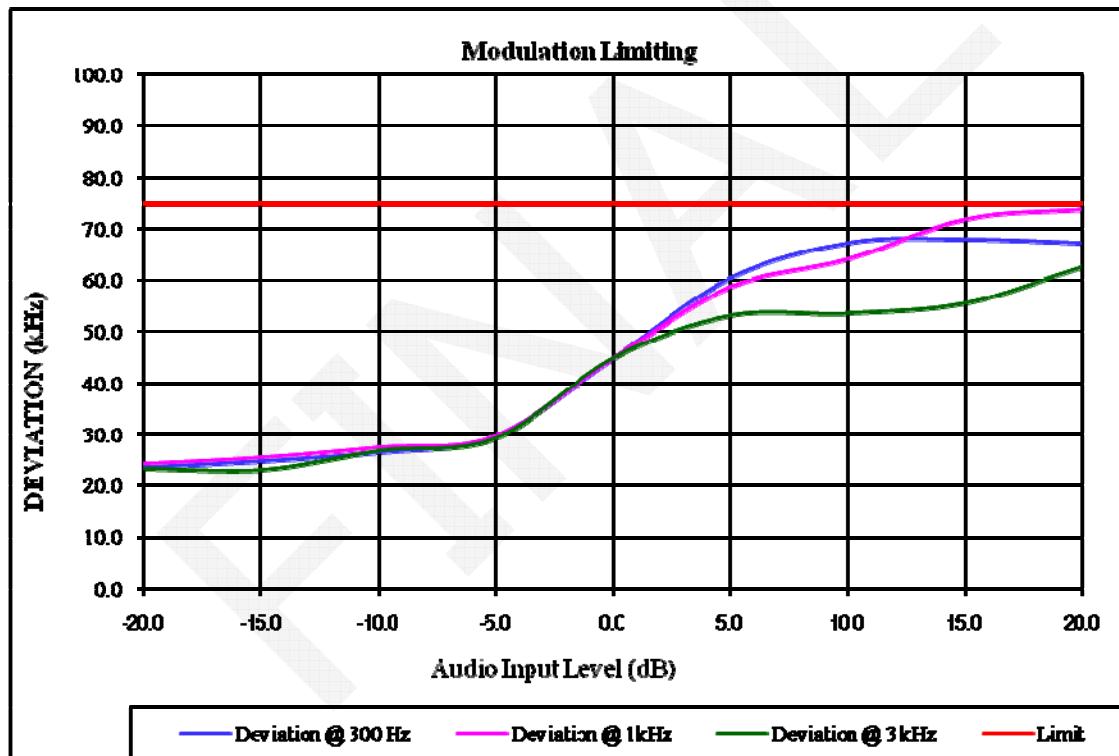
Carrier Frequency: 199.6 MHz, Positive

AUDIO INPUT LEVEL	DEVIATION (@300Hz)	DEVIATION (@ 1kHz)	DEVIATION (@ 3kHz)	Limit
dB	kHz	kHz	kHz	kHz
20.0	68.12	73.87	62.97	75.0
15.0	68.41	72.47	55.50	75.0
10.0	66.87	62.89	54.72	75.0
5.0	61.10	58.08	53.69	75.0
0.0	45.00	45.00	45.00	75.0
-5.0	29.17	29.47	28.69	75.0
-10.0	26.27	26.17	25.97	75.0
-15.0	25.26	24.51	24.47	75.0
-20.0	23.91	23.55	23.24	75.0



Carrier Frequency: 199.6 MHz, Negative

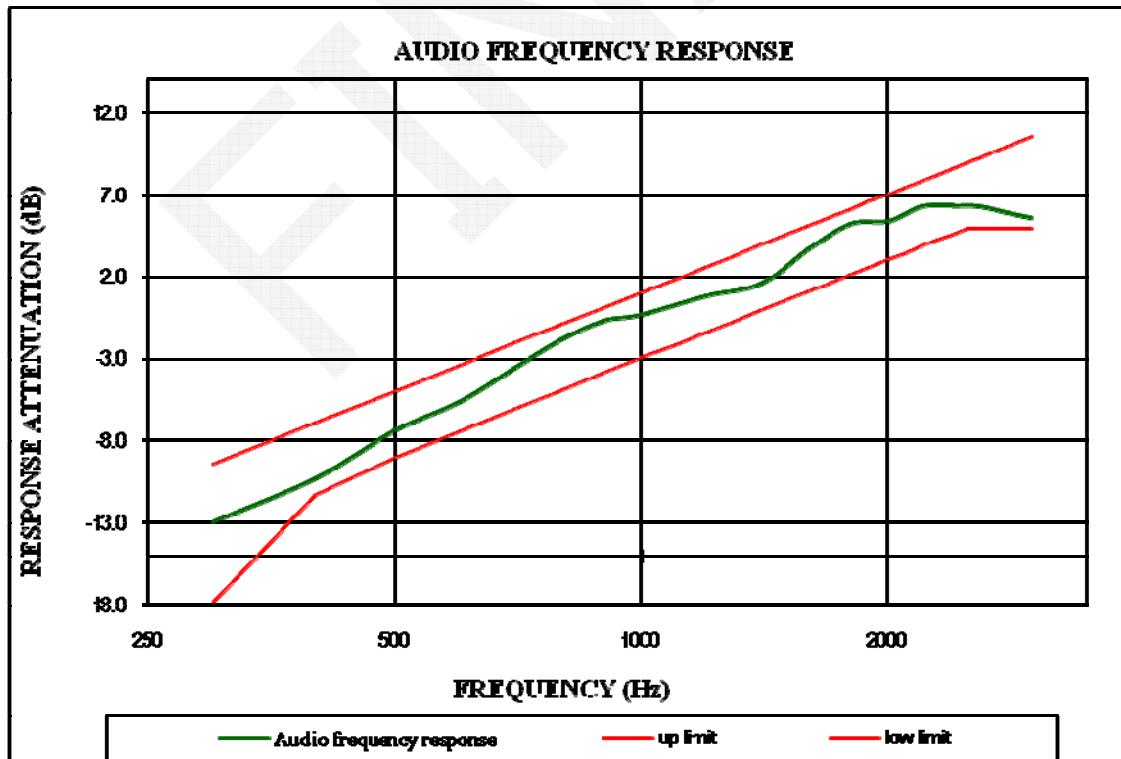
AUDIO INPUT LEVEL	DEVIATION (@300Hz)	DEVIATION (@ 1kHz)	DEVIATION (@ 3kHz)	Limit
dB	kHz	kHz	kHz	kHz
20.0	67.22	73.68	62.65	75.0
15.0	67.92	71.92	55.54	75.0
10.0	67.30	64.07	53.56	75.0
5.0	60.47	58.66	53.22	75.0
0.0	45.00	45.00	45.00	75.0
-5.0	29.63	29.67	29.16	75.0
-10.0	26.49	27.51	26.74	75.0
-15.0	24.87	25.44	23.06	75.0
-20.0	23.56	24.22	23.41	75.0



Audio Frequency Response

Carrier Frequency: 199.6 MHz,

Audio Frequency (Hz)	Response Attenuation (dB)
300	-12.91
400	-10.29
500	-7.43
600	-5.66
700	-3.60
800	-1.87
900	-0.71
1000	-0.37
1200	0.82
1400	1.55
1600	3.65
1800	5.21
2000	5.36
2200	6.22
2400	6.31
2600	6.28
2800	5.86
3000	5.57



FCC §2.1049&74.861 – OCCUPIED BANDWIDTH & EMISSION MASK

Applicable Standard

FCC §2.1049, §74.861

(e) (5) The operating bandwidth shall not exceed 200 kHz.

(e) (6) The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

(i) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB;

(ii) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB;

(iii) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least $43 + 10\log_{10}$ (mean output power in watts) dB.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
HP	RF Communications Test Set	8920A	00 235	2015-05-09	2016-05-09
Sunol Sciences	Antenna	JB3	A060611-1	2013-09-05	2016-09-05
R&S	EMI Test Receiver	ESCI	100224	2015-05-09	2016-05-09
N/A	Coaxial Cable	14m	N/A	2015-05-06	2016-05-06
N/A	Coaxial Cable	8m	N/A	2015-05-06	2016-05-06

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

Modulate the transmitter with a 2500 Hz sine wave at an input level 16 dB greater than that necessary to produce 50% of rated system deviation. The input level shall be established at the frequency of maximum response of the audio modulating circuit.

Test Data

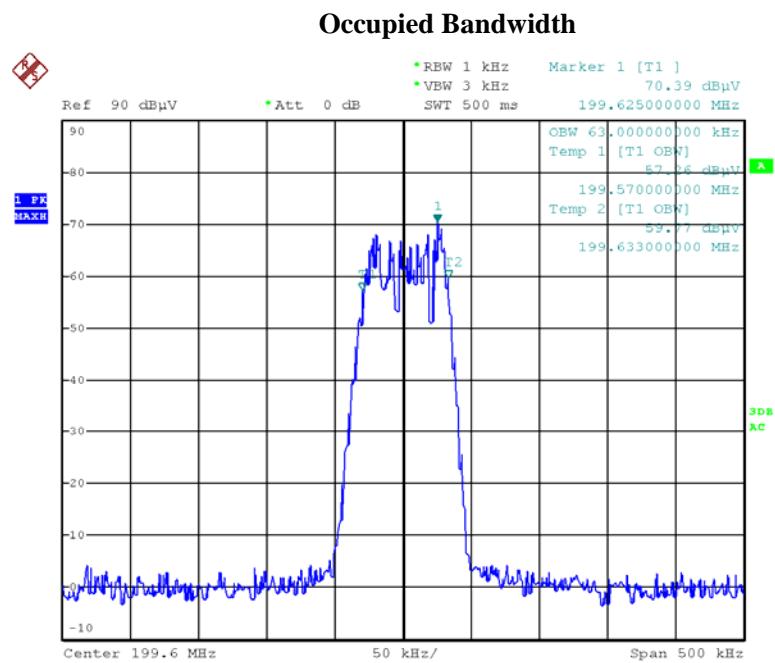
Environmental Conditions

Temperature:	27.5 °C
Relative Humidity:	61 %
ATM Pressure:	100.3 kPa

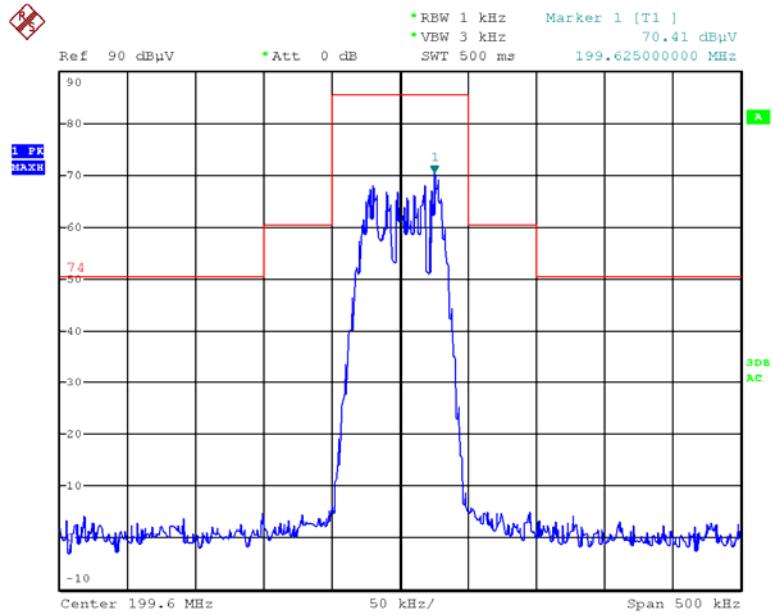
The testing was performed by Dean Liu on 2015-09-20.

Test Result: Compliance. Please refer to the following table and plot.

f_c	99% Occupied Bandwidth	Limit
MHz	kHz	kHz
199.6	63.00	200



Date: 20.SEP.2015 14:20:05

Emission Mask

Date: 20.SEP.2015 14:19:50

FCC

FCC §2.1053 & §74.861 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

FCC §2.1053 and §74.861

(e) (6) The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:

(iii) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least $43 + 10\log_{10}$ (mean output power in watts) dB.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
HP	Signal Generator	8648A	3426A00831	2014-11-06	2015-11-06
Sunol Sciences	Antenna	JB3	A060611-1	2013-09-05	2016-09-05
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
HP	Amplifier	8447E	2434A02181	2015-09-06	2016-09-06
R&S	EMI Test Receiver	ESCI	100224	2015-05-09	2016-05-09
Agilent	Signal Generator	E8247C	MY43321350	2013-10-15	2015-10-15
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
TDK RF	Horn Antenna	HRN-0118	130 084	2013-09-06	2016-09-06
ETS LINDGREN	Horn Antenna	3115	000 527 35	2013-09-06	2016-09-06
R&S	Spectrum Analyzer	FSEM	DE31388	2015-05-09	2016-05-09
N/A	Coaxial Cable	14m	N/A	2015-05-06	2016-05-06
N/A	Coaxial Cable	8m	N/A	2015-05-06	2016-05-06

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to teeth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Test Data

Environmental Conditions

Temperature:	27.1°C
Relative Humidity:	58 %
ATM Pressure:	100.3 kPa

The testing was performed by Dean Liu on 2015-09-21.

Test Mode: Transmitting

Frequency (MHz)	Polar (H/V)	Receiver Reading (dB μ V)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Frequency: 199.6 MHz								
399.200	H	33.34	-49.6	0.0	0.6	-50.2	-13.0	37.2
399.200	V	49.32	-31	0.0	0.6	-31.6	-13.0	18.6
598.800	H	33.96	-45.7	0.0	0.8	-46.5	-13.0	33.5
598.800	V	46.64	-30.4	0.0	0.8	-31.2	-13.0	18.2
798.400	H	40.43	-34.8	0.0	0.9	-35.7	-13.0	22.7
798.400	V	47.84	-24.4	0.0	0.9	-25.3	-13.0	12.3
998.000	H	33.09	-38.5	0.0	1	-39.5	-13.0	26.5
998.000	V	47.15	-21.2	0.0	1	-22.2	-13.0	9.2
1197.600	H	36.08	-31.9	6.2	1.3	-27.0	-13.0	14.0
1197.600	V	36.38	-34.6	6.2	1.3	-29.7	-13.0	16.7

Note:

- 1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- 2) Absolute Level = SG Level - Cable loss + Antenna Gain
- 3) Margin = Limit-Absolute Level

FCC §2.1055 & § 74.861- FREQUENCY STABILITY

Applicable Standard

FCC §2.1055, § 74.861

(e)(4) The frequency tolerance of the transmitter shall be 0.005 percent.

Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Due Date
Dongzhixu	High Temperature Test Chamber	DP1000	201105083-4	2015-08-11	2016-08-11
UNI-T	Multimeter	UT39A	M130199938	2015-04-10	2016-04-10
Pro instrument	DC Power Supply	pps3300	/	2015-05-09	2016-05-09
R&S	EMI Test Receiver	ESCI	100224	2015-05-09	2016-05-09
SRTEK	Monopole Antenna	N/A	N/A	2015-05-09	2016-05-09

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to DC power supply and the RF output was connected to a frequency counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The power leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the counter.

The frequency stability shall be measured with variation of primary supply voltage as follows:

- (1) Vary primary supply voltage from 85 to 115 percent of the nominal value.
- (2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

Test Data

Environmental Conditions

Temperature:	27.1 °C
Relative Humidity:	58 %
ATM Pressure:	100.3kPa

The testing was performed by Dean Liu on 2015-09-21.

Test Mode: Transmitting

Reference Frequency: 199.6 MHz, Limit: 50 ppm			
Temerature	Voltage	Reading	Frequency Error
°C	V_{DC}	MHz	ppm
-30	9	199.608354	41.85
-20	9	199.607232	36.23
-10	9	199.605617	28.14
0	9	199.604312	21.60
10	9	199.602227	11.16
20	9	199.601839	9.21
30	9	199.601945	9.74
40	9	199.602201	11.03
50	9	199.602715	13.60
20	8	199.606257	31.35

Note: The battery operating end point is 8V which specified by manufacturer.

***** END OF REPORT *****